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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MOORE, KARLA A

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 02/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,424

Applicant(s)

RAFFIN ET AL.

Examiner

Karla Moore

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 10-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 15 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☒ Claim(s) 1-16 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-9 and 15-16, drawn to a multideposition sub-atmospheric chemical vapor deposition (SACVD) reactor and a susceptor for dielectric material deposition in a SACVD reactor resistant to NF_3 attack, classified in class 118, subclass 712.
 - II. Claims 10-14, drawn to a method of in-situ conditioning a carbon susceptor in a AME Centura reactor to render it NF_3 resistant, classified in class 427. The inventions are distinct, each from the other because of the following reasons:
2. Inventions I and II are related as process of making and product (apparatus) made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the susceptor could be coated in a reactor other than a AME Centura reactor or the product could be made wherein both sides of the susceptor are coated using the same precursor or the process could be carried out without first cleaning the interior volume of the reactor.
3. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Ms. Margaret Pepper on January 08, 2003 a provisional election was made with traverse to prosecute the invention of I, claims 1-9 and 15-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-14 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

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5. Claim 16 recites the limitation "said bottom polysilicon coating" and "said top polysilicon coating". There is insufficient antecedent basis for this limitation in the claim. Claim 16 was interpreted as the following: wherein said polysilicon coating comprises a bottom silicon coating and a top silicon coating of different thicknesses, wherein the said top silicon coating has a thickness of about 4 μm and said bottom silicon coating has a thickness of about 1.5 μm . Examiner recommends rewriting the claim 16 as noted above, or in a similar way, for clarification purposes

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of U.S. Patent No. 6,071,353 to Gallagher in view of U.S. Patent No. 4,795,880 to Hayes et al.

8. Applicant's admitted prior art discloses the invention, a multideposition sub-atmospheric chemical vapor deposition (SACVD) reactor) substantially as claimed and comprising: a substrate processing chamber (Figure 1, 11); a carbon susceptor (Figure 1, 13) adapted to hold a substrate in said substrate processing chamber during a SACVD operation; a gas distribution system (Figure 1, 17) adapted to introduce gases into said substrate processing chamber and including appropriate valves, gas supply lines and other equipment necessary to flow gases into said substrate processing chamber, wherein said gases include dielectric/non-dielectric forming gases and in-situ cleaning gases that are aggressive to carbon; a heating system (Figure 1, 16) to heat said susceptor to an adequate deposition temperature; and a pressurization system (not numbered) adapted to set a pressure level within said substrate processing chamber (page 9, row 6 through page 10, row 4).

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9. With respect to limitations drawn to specific gases in claims 1-9, used for specific operations of the claimed apparatus, the courts have ruled that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

10. With respect to claims 7-9 which recite specific processing parameters for a specific operation of the claimed apparatus, the courts have ruled a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2d 1647 (Bd. Pat App. & Inter. 1987).

11. The prior art apparatus, in this case the Centura HTF disclosed in the applicant's specification meets all of the structural limitations of the claims and is capable of the pressures, temperatures and flow rates as claimed (see page 9, row 6 through page 10, row 4 and background of the invention).

12. However, the prior art does not disclose a carbon susceptor adapted to hold a substrate in a substrate processing chamber during a SACVD operation, wherein the carbon susceptor is coated by a polysilicon film to protect it against cleaning gases.

13. Gallagher discloses a susceptor coated by a polysilicon film and adapted to hold a substrate in a processing chamber during a SACVD operation for the purpose of protecting a processing kit (including the susceptor) during an etching/cleaning process (column 3, rows 12-18).

14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a carbon susceptor coated with a film of polysilicon in the Applicant's admitted prior art in order to protect the susceptor from damage during an etching/cleaning process as taught by Gallagher.

15. Applicant's admitted prior art and Gallagher disclose the invention substantially as claimed and as described above.

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16. However, the prior art fails to teach a controller coupled to said gas distribution system and pressurization system for directing operation of the SACVD reactor.

17. Hayes et al. teach the use of a controller coupled to a gas distribution system and a pressurization system for the purpose of metering the required amount of selected gases into the reaction furnace reaction tube and maintaining the specified flow and pressure level for a certain period of time (column 2, rows 53-57).

18. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller coupled to gas distribution and pressurization systems in the prior art in order to meter the required amount of selected gases into the reaction furnace reaction tube and maintain the specified flow and pressure level for a certain period of time as taught by Hayes et al.

19. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of U.S. Patent No. 6,071,353 to Gallagher.

20. Applicant's admitted prior art discloses a carbon susceptor substantially as claimed and as described above.

21. However, the prior art does not disclose a carbon susceptor coated by a polysilicon film to protect it against cleaning gases, such as NF_3 .

22. Gallagher discloses a susceptor coated by a polysilicon film and adapted to hold a substrate in a processing chamber during a SACVD operation for the purpose of protecting a processing kit (including the susceptor) during an etching/cleaning process (column 3, rows 12-18).

23. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a carbon susceptor coated with a film of polysilicon in the Applicant's admitted prior art in order to protect the susceptor from damage during an etching/cleaning process as taught by Gallagher.

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Allowable Subject Matter

24. Claim 16 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

25. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or fairly suggest a carbon plate coated by a polysilicon coating, wherein said polysilicon coating comprises a bottom silicon coating and a top silicon coating of different thicknesses, wherein the said top silicon coating has a thickness of about 4 μm and said bottom silicon coating has a thickness of about 1.5 μm .

Conclusion


26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
January 22, 2003


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700